ELECTRIC TERMS.

The Units of Measurement and What They Mean.

AMPERES, VOLTS AND WATTS.

Broadly Speaking, Amperes Indicate Volume, Volts Measure Pressure and Watts Show the Resulting Quantity. The Kilowatt Hour.

It has been estimated that the time and labor wasted by those engaged in selling electricity in trying to make their customers understand a kilowatt would suffice to build a string of pyramids from New York to San Francisco, writes Allen Hollis. The discouraging feature of the task is that after all this effort the customer still remains ignorant and cherishes the delusion that the method of electric measurement is a devious device for concealing nefarious practices by the electric light companies.

The average American is perfectly satisfied to buy gas by the foot, transportation by the mile and telephones by the month, but watts look suspicious and kilowatts totally depraved. This difficulty might have been avoided if the eminent scientists who first adopted these accurate and to them convenient terms had been willing to show the rest of the world how to compute electric quantity in feet and inches or barrels and quarts. Lacking this, people are left to struggle with their mysterious method of measurements.

The kilo is an old friend (or ancient enemy, if you will) borrowed from the metric system.

This leads to the definition of a watt. But in order to know watts one must first learn about the two other members of the family, amperes and volts. Broadly speaking, amperes measure volume, volts pressure and watts the resulting quantity.

In order to get a tangible idea of the ampere, electricity may be compared with water flowing through a pipe. In this illustration the ampere will represent the volume of water, which is determined by the size of the pipe, but this should not be confused with the size of the electric wire, which has nothing to do with the present problem. The ampere then measures the volume of current flowing in the wire at a given time. The quantity of energy flowing will depend upon the other factor, which is expressed in volts.

The volt may be considered the measure of pressure or intensity. In the illustration of water flowing through a pipe the pressure is commonly expressed in pounds to the square inch. With electric energy the same idea is expressed in volts. It is evident that the quantity of water flowing in a pipe of a given size will increase as the pressure increases. In a similar way the quantity of electricity increases in exact proportion to the electric pressure of voltage, and this quantity is measured by watts.

The quantity (watts) of electricity delivered over a single circuit is the direct product of the volume (amperes) multiplied by the pressure (volts). In other words, amperes multiplied by volts equals watts.

The illustration serves to indicate the theory of electric measurement. It is likely, however, to be misleading unless the fact is kept in mind that water is material, while electricity manifests itself only through its capacity of affecting visible things. It heats the filament in an incandescent lamp and gives us light, it turns our motors, it magnetizes telephone and telegraph instruments, but always it conceals its own personality.

In order to know what a watt actually is it is necessary to ascertain what it will do. A thousand (kilo) watts are the mechanical equivalent of one and one-third horsepower—that is, a mechanical horsepower equals 746 watts of energy. Lighting circuits usually carry 110 to 120 volts. An ordinary sixteen candle power lamp takes a little less than half an ampere in volume and consequently consumes about fifty watts of current. With the tungsten lamp the rating by watts instead of candle power has been introduced and bids fair to become universally adopted.

Being thus furnished with a standard of measurement it is necessary only to multiply the amount employed (commonly called "capacity") by the number of hours of use to get the actual quantity consumed in watt hours. The sixteen candle power lamp, with its fifty watts capacity, consumes fifty watt hours each hour it is used. The customary unit of consumption is the kilowatt hour, (1,000 watts used one hour), and the lamp will consume this quantity in twenty hours. The ordinary electric meter (recording watt meter) records automatically the number of kilowatt hours used, being operated by a mechanism which runs at a speed which corresponds to the capacity employed.—Rollins' Magazine.

Bismarck and No. 3.

Bismarck held that three was the perfect number, for he had served three masters, he had three names, three oak leaves figure in his family arms, he was concerned in three wars, he signed three treaties of peace, in the Franco-Prussian war he had three horses killed under him, he brought about the meeting of three emperors, he was responsible for the triple alliance, he had three children, his family motto was "Strength in trinity," and caricaturists depicted him with three hairs on his head.

Error in itself is always invisible. Its nature is the absence of light.—Jacobi.

DEADLY OIL TANKS

Ships That Are a Constant Menace to All on Board.

DEATH LURKS IN THE CARGO.

Besides the Constant Danger of the Oil Heating and Exploding and Instantly Destroying the Vessel There Is Also the Peril of "Fuming."

The most dangerous sort of ship afloat is that particular kind of vessel known as the oil tank, and there isn't a sailorman who will sign on for a voyage in one if he can get a job on board any other class of vessel.

The oil tank is a vessel whose cargo consists of oil, which is carried in great tanks. Two dangers are ever present to all on board—namely, that the oil may heat and explode, which means the instant destruction of the ship, or that it may burst from the tanks, in which case the ship is almost certain to be destroyed by fire.

There is also the remote danger of the oil "fuming." When the oil "fumes" the working of the ship becomes almost impossible. On a "fuming" oil tank no one can remain below deck for more than ten minutes without becoming overcome by the oil fumes, which are a hundred times more deadly to human life than coal gas.

The most terrible tragedies of the ocean have occurred on board these death traps.

A few years ago a Russian oil tank, the Omar, which sailed from Batum bound for Bombay with 40,000 gallons of oil on board, was sighted in the Pacific by a German tramp steamer named the Velter Fend. The Omar was flying signals of distress and when sighted was apparently completely disabled, for she was making no headway.

The sea was quite calm, and the captain of the Velter Fend approached within hailing distance of the disabled ship, but no reply came from her in response to his hail.

Then the captain of the German tramp sent a boat to the silent ship. When the boat's crew reached her decks they saw five men lying on the deck, three of whom were dead. The other two were in a state of collapse, but alive.

The mate of the German tramp, who was in charge of the boat, at once guessed that the oil had "fumed" on board the oil tank, probably at night, and that the two men in a state of collapse were probably the only survivors of the disaster. This subsequently turned out to be the case.

Below the decks, which the crew of the German tramp penetrated with great difficulty and danger to themselves, for the oil was still fuming, six of the oil tank's crew were found dead in their bunks, where they had been suffocated by the fumes in their sleep. Three of the crew had succeeded in reaching the deck, but had died subsequently.

The two survivors were the only two on deck when the fumes burst from the tanks and in their efforts to save the others had very nearly perished themselves.

The crew of a Norwegian oil tank named the Helios had a terrible experience a few years ago in mid-Atlantic. During a heavy gale, in which the Helios suffered very rough handling in the mountainous seas, her oil tanks, containing 60,000 gallons of crude oil, burst and flowed into the bunkers, threatening to penetrate in a few minutes into the fireroom.

The crew flung themselves at the pumps like madmen. The oil soon began to fume, and no man could keep at the pumps for more than a few minutes without becoming overpowered. The captain of the Helios ordered all the crew on deck, and four in their turn went below every five minutes to work at the pumps.

The fight they made for their lives was one of the most desperate that has ever been waged on the ocean. Directly the tank had burst the firemen had been ordered out of the fireroom. There was no time to quench the fires, for the firemen would certainly have been suffocated by the fumes of the oil had they remained below to do so.

For eleven hours the officers and crew of the Helios worked like demons at the pumps, making the most desperate efforts to keep the oil from reaching the fire room. By the end of that time eight of the crew lay unconscious on the deck, overcome partly by exhaustion and partly by the fumes.

It was now only possible to work two of the pumps, and it became certain that, unless help arrived in another hour, the ship, with every living soul on board, would perish. It should be mentioned that every lifeboat on the Helios had been damaged during the storm.

Half an hour passed, and by then only the captain and the mate were working at the pumps. The destruction of the vesel was now only a matter of minutes. It was at this critical juncture that the oil tank was sighted by the Majestic of the White Star line, and twenty minutes later the crew of the doomed ship were safely on board the liner.

As the last man scrambled on board the Majestic from the boat which had been sent to the help of the Helios a mountain of flame sprang from the decks of the oil tank, and a few minutes later the blazing vessel sank below the water.

A Russian oil tank named the Vladimir some years ago exploded in mid-ocean, when every one of her crew perished. This disaster took place in the southern Pacific.—London Answers.